REMARKS/DISCUSSION OF ISSUES

Claims 1-20 are pending in the application.

The Examiner is respectfully requested to state whether the drawings are acceptable.

Claims 1-20 remain pending in the application. Reexamination and reconsideration of the present application are requested.

35 U.S.C. § 103

The Office Action rejected claims 1-20 under 35 U.S.C. § 103 over: (1) Hiroshi et al. (JP application no. 6-148661) ("Hiroshi") in view of Shimada et al. (U.S. Patent No. 6,128,060) ("Shimada") or Moshrefzadeh (U.S. Patent No. 6,037,005) ("Moshrefzadeh"); and (2) Shimkunas (U.S. Patent No. 4,696,878) ("Shimkunas") or Moshrefzadeh in view of Shimada.

Applicants traverse those rejections for at least the following reasons.

Claims 1-20 are Patentable over Hiroshi in view of Shimada or Moshrefzadeh

At the outset, in reviewing the rejection of claims 1-20 over Hiroshi in view of Shimada or Moshrefzadeh on pages 2-3 of the Office Action, Applicants do not see any description of the supposed relevance of the Moshrefzadeh reference. Indeed, other than in the very first sentence reciting the rejection, Applicants see no mention whatsoever of Moshrefzadeh on pages 2 or 3.

Applicants have already previously pointed out this apparent error in the "Response Under 37 C.F.R. § 1.111" filed on 13 June 2003. Accordingly, if the Examiner really intended to cite Moshrefzadeh in combination with Hiroshi as a basis for rejecting claims 1-20, an explanation of the rejection is respectfully requested. Otherwise, withdrawal of the statement that claims 1-20 are rejected based upon the combination of over Hiroshi and Moshrefzadeh is respectfully requested.

Claim 1

Among other things, the method of claim 1 includes: (1) providing on the upper surface of each of the lines of transparent conducting material a covering layer

extending from an end part of a line and partially covering the upper surface of the line, and (2) subjecting the lines to a metal electroplating process in which **a plating potential is applied to each line at the end part**.

Applicants respectfully submit that no such feature is disclosed in Hiroshi, Shimada, or Moshrefzadeh.

Applicants have reviewed the cited FIGs. 1-2 in Hiroshi and see nothing that would indicate or even suggest that a covering layer extends from an end part of a line, or that a plating potential is applied to each line at the end part.

As for the newly-cited paragraph 29 of the detailed description in Hiroshi, the paragraph only mentions that nickel is electroplated onto exposed areas of the ITO 9, and a gold layer is disposed upon the nickel, but it does not explain that process. Paragraph 29 does not disclose that a covering layer **extends from an end part of a line** or that **a plating potential is applied to each line at the end part**.

Shimada has apparently only been cited as showing the structure of various components of an active matrix device which are not specifically recited in the method of claim 1. So, Applicants respectfully submit that the above-mentioned features of claim 1 do not appear in Shimada either.

Also, as noted above, the Office Action fails to make any mention at all of how of Moshrefzadeh in this section of the Office Action, or how it is proposed to combine Hiroshi with Moshrefzadeh.

Furthermore, Applicants respectfully traverse the proposed combination of Hiroshi and Shimada or Moshrefzadeh as lacking any motivation or suggestion whatsoever in the prior art. The Office Action fails to cite anything in the prior art that suggests applying the process of Hiroshi to Shimada (or Moshrefzadeh) would "provide a liquid crystal device having a sufficiently small deviation among threshold characteristics of thin film transistor."

Therefore, no possible combination of the teachings of Hiroshi, Shimada, or Moshrefzadeh could produce the method of claim 1 including the features of providing on the upper surface of each of the lines of transparent conducting material a covering layer extending from an end part of a line and partially covering the upper

surface of the line, and subjecting the lines to a metal electroplating process in which a plating potential is applied to each line at the end part.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 1 is patentable over Hiroshi and Shimada or Moshrefzadeh.

Claims 2-10 and 16-20

Claims 2-10 and 16-20 depend variously from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1, and for the following additional reasons.

Claim 2

Among other things, in the method of claim 2, the covering layer is shaped such that the exposed surface of the line increases progressively away from the end part.

The Office Action states that the shape of the covering layer is obvious "since apparatus limitations, unless they affect the process in a manipulative sense, may have little weight in process claims."

However, Applicants respectfully submit that: (1) shaping the covering layer such that the exposed surface of the line increases progressively away from the end part is a not an "apparatus limitation," but a process feature of the method claim 2; and (2) the shape of the covering layer absolutely does "manipulate" the claimed method and its results. For example, as taught in the specification, by providing a method where the exposed surface of the line increases progressively away from the end part, "the extent of non-uniformity in the plating layer thickness is considerably reduced" (page 14, line 26 - page 15, line 11).

No such features or benefits are disclosed or suggested by any of the cited prior art references.

Accordingly, for at least these additional reasons, Applicants respectfully submit that the method of claim 2 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claim 3

Among other things, in the method of claim 3, the covering layer tapers

in width away from the end part.

In similarity to claim 2, Applicants respectfully submit that: (1) shaping the covering layer such that it tapers in width away from the end part is a not an "apparatus limitation," but a process feature of the method claim 3; and (2) the shape of the covering layer absolutely does "manipulate" the claimed method and its results. As taught in the specification, by providing a method where the covering layer tapers in width away from the end part, "the extent of non-uniformity in the plating layer thickness is considerably reduced" (page 14, line 26 - page 15, line 11).

No such features or benefits are disclosed or suggested by any of the cited prior art references.

Accordingly, for at least these additional reasons, Applicants respectfully submit that the method of claim 3 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claim 4

Among other things, in the method of claim 4, the covering layer is stepped in width along the line.

In similarity to claim 2, Applicants respectfully submit that: (1) shaping the covering layer such that it is stepped in width along the line is a not an "apparatus limitation," but a process feature of the method claim 4; and (2) the shape of the covering layer absolutely does "manipulate" the claimed method and its results. As taught in the specification, by providing a method where the covering layer is stepped in width along the line, "the extent of non-uniformity in the plating layer thickness is considerably reduced" (page 14, line 26 - page 15, line 11).

No such features or benefits are disclosed or suggested by any of the cited prior art references.

Accordingly, for at least these additional reasons, Applicants respectfully submit that the method of claim 4 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claim 5

Among other things, in the method of claim 5, the covering layer

extends from both ends of the line in similar manner and **the plating potential is applied at both ends of the line during the plating process**.

No such features are disclosed or suggested by the cited prior art. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such features. **Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 5, or allow the claim**.

Claim 8

Among other things, in the method of claim 8, the step of forming the lines comprises: depositing a layer of transparent conducting material over the substrate, depositing a photoresist layer over the layer of transparent conducting material and patterning the photoresist into a configuration corresponding to the desired lines, and patterning the transparent conducting layer using the photoresist to leave the lines of transparent conducting material, and the photoresist layer is patterned into portions corresponding to the desired lines with each portion including a selected region having a first thickness and conforming with the form of the required covering layer with the remainder of the portion being of reduced thickness, and after patterning the transparent conducting layer the photoresist is partially etched to remove the areas of reduced thickness while leaving photoresist at the selected region which photoresist constitutes the covering layer.

The Office Action makes no mention whatsoever of these features. Indeed, from inspection of Hiroshi, it appears that the photoresist layer 3 is deposited over the ITO areas 2 with a single, uniform thickness. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such features. **Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 8, or allow the claim**.

Claim 10

Among other things, in the method of claim 10, photoresist is left over pixel electrode regions during the electroplating process.

The Office Action makes no mention whatsoever of these features. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. **Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 5, or allow the claim**.

Claim 11

Among other things, the method of claim 11 includes: (1) defining a photoresist to leave a photoresist region on each conductor line **extending from one end part of the line** partially covering the surface of the line, and (2) selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with **a plating potential being applied at the end part of each line**.

Applicants respectfully submit that no such features are disclosed in Hiroshi, Shimada, or Moshrefzadeh.

Applicants have reviewed the cited FIGs. 1-2 in Hiroshi and see nothing that would indicate or even suggest that the photoresist layer 3 extends **from an end part of a line**, or that a plating potential is **applied at the end part of each line**.

As for the newly-cited paragraph 29 of the detailed description in Hiroshi, the paragraph only mentions that nickel is electroplated onto exposed areas of the ITO 9, and a gold layer is disposed upon the nickel, but it does not explain that process. Paragraph 29 does not disclose that a photoresist region **extends from an end part of a line** or that **a plating potential is applied to each line at the end part**.

Shimada has apparently only been cited as showing the structure of various components of an active matrix device. So, Applicants respectfully submit that the above-mentioned features of claim 11 do not appear in Shimada either.

Also, as explained above with respect to claim 1, the Office Action fails to make any mention at all of how of Moshrefzadeh in this section of the Office Action, or how it is proposed to combine Hiroshi with Moshrefzadeh.

Therefore, no possible combination of the teachings of in Hiroshi, Shimada, or Moshrefzadeh suggest the method of claim 11 including the features of defining a photoresist to leave a photoresist region on each conductor line extending from one

end part of the line partially covering the surface of the line, and selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 11 is patentable over Hiroshi and Shimada or Moshrefzadeh.

Claims 12-13 and 15

Claims 12-13 and 15 depend from claim 11 and are deemed patentable for at least the reasons set forth above with respect to claim 11, and for the following additional reasons.

Claim 12

Among other things, in the method of claim 12, the photoresist layer is patterned into areas of different thicknesses at the conductor lines, and the step of defining the photoresist comprises partially etching the photoresist to remove the thinner areas.

The Office Action makes no mention whatsoever of these features. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such features. **Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 12, or allow the claim**.

Claims 13 and 15

Among other things, in the methods of claims 13 and 15, the photoresist is defined to leave on each line a similar photoresist region extending from the other end part and wherein the plating potential is applied also at that other end part.

The Office Action makes no mention whatsoever of this feature. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. **Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claims 13 and 15, or allow the claims**.

Claim 14

Among other things, the display device of claim 14 includes an active plate made according to the method of claim 11. As explained above, no possible combination of the teachings of in Hiroshi, Shimada, or Moshrefzadeh could produce the method of claim 11. Therefore, they also could not produce the display device of claim 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the device of claim 14 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claims 1-20 are Patentable over Shimkunas or Moshrefzadeh in view of Shimada

Claim 1

Among other things, the method of claim 1 includes: (1) providing on the upper surface of each of the lines of transparent conducting material a covering layer **extending from an end part of a line** and partially covering the upper surface of the line, and (2) subjecting the lines to a metal electroplating process in which **a plating potential is applied to each line at the end part**.

Applicants respectfully submit that no such feature is disclosed in Shimkunas Shimada, or Moshrefzadeh. Applicants have reviewed the cited FIGs. 4a-4g in Shimkunas and see nothing that would indicate or even suggest that a covering layer **extends from an end part of a line**, or **that a plating potential is applied to each line at the end part**. Indeed, Applicants see nothing in Shimkunas that even discloses or suggests that any lines are formed on the substrate 101 at all!

Shimada has apparently only been cited as showing the structure of various components of an active matrix device which are not specifically recited in the method of claim 1. So, Applicants respectfully submit that the above-mentioned features of claim 1 do not appear in Shimada either.

Furthermore, Applicants respectfully traverse the proposed combination of Shimkunas and Shimada as lacking any motivation or suggestion whatsoever in the prior art. The Office Action fails to cite anything in the prior art that suggests applying

the process of Shimkunas and Shimada would "provide a liquid crystal device having a sufficiently small deviation among threshold characteristics of thin film transistor." Shimkunas doesn't even pertain to a liquid crystal device. Additionally, Shimkunas teaches a method of making an X-Ray photolithography mask. Shimkunas does not disclose any process for making lines on any substrate for a display or semiconductor device, or anything of the sort. Shimkunas' mask does not even have any thin film transistors, nor does it teach anything about any threshold voltages for any thin film transistors.

Applicants can imagine no motivation other than Applicants' own disclosure that would motivate one to cobble together any parts of Shimkunas and Shimada to try to produce the method of claim 1.

Therefore, no possible combination of the teachings of Shimkunas and Shimada could produce the method of claim 1 including the features of providing on the upper surface of each of the lines of transparent conducting material a covering layer extending from an end part of a line and partially covering the upper surface of the line, and subjecting the lines to a metal electroplating process in which a plating potential is applied to each line at the end part.

Meanwhile, Moshrefzadeh fails even to show any lines of transparent conducting material (the layer 22 is apparently a continuous layer that is later patterned into pixels). Moreover, the metal coating 26 in Moshrefzadeh is **not** electroplated onto layer 22, but instead, Moshrefzadeh specifically teaches that:

> "A metal coating 26 is then **deposited** over the substrate as shown in FIG. 1(c)."

Moshrefzadeh at col. 5, lines 35-36 (emphasis added).

Furthermore, Applicants respectfully traverse the proposed combination of Shimada and Moshrefzadeh as lacking any motivation or suggestion whatsoever in the prior art. Indeed, the Office Action failed to explain at all how or why it is proposed to combine Moshrefzadeh with Shimada.

Therefore, no possible combination of the teachings of Shimada and Moshrefzadeh could produce the method of claim 1 including the features of providing on the upper surface of each of the lines of transparent conducting material a covering layer extending from an end part of a line and partially covering the upper surface of the line, and subjecting the lines to a metal electroplating process in which a plating potential is applied to each line at the end part.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 1 is patentable over Shimkunas or Moshrefzadeh and Shimada.

Claims 2-10 and 16-20

Claims 2-10 and 16-20 depend variously from claim 1 and are deemed patentable over Shimkunas or Moshrefzadeh and Shimada for at least the reasons set forth above with respect to claim 1, and for the following additional reasons.

As explained above with respect to the rejection of claims 2-10 and 16-20 over the combination of Hiroshi, Shimada, and Moshrefzadeh: (1) the features of claims 2-5 are not "apparatus limitations," but process features, and the recited shapes of the covering layer absolutely do "manipulate" the claimed method and its results and carry significant patentable weight; and (2) claims 2-10 and 16-20 recite numerous specific features which are not even mentioned anywhere in the Office Action, and Applicants respectfully request a citation to something in Shimkunas, Moshrefzadeh, or Shimada that supposedly discloses these features, or a withdrawal of their rejection.

Accordingly, for at least these additional reasons, Applicants respectfully submit that the methods of claims 2-10 and 16-20 are patentable over Shimkunas or Moshrefzadeh and Shimada.

Claim 11

Among other things, the method of claim 11 includes: (1) defining a photoresist to leave a photoresist region on each conductor line **extending from one end part of the line** partially covering the surface of the line, and (2) selectively electroplating the exposed areas of the transparent conductor lines with a metallic

layer **with a plating potential being applied at the end part of each line**.

Applicants respectfully submit that no such features are disclosed in Shimkunas, Moshrefzadeh, or Shimada.

Applicants have reviewed the cited FIGs. 4a-4g in Shimkunas and see nothing that would indicate or even suggest that a photoresist region **extends from an end part of a line**, or **that a plating potential is applied to each line at the end part**. Indeed, Applicants see nothing in Shimkunas that even discloses or suggests that any lines are formed on the substrate 101 at all!

Shimada has apparently only been cited as showing the structure of various components of an active matrix device which are not specifically recited in the method of claim 11. So, Applicants respectfully submit that the above-mentioned features of claim 11 do not appear in Shimada either.

Furthermore, Applicants respectfully traverse the proposed combination of Shimkunas and Shimada as lacking any motivation or suggestion whatsoever in the prior art for the reasons set forth above with respect to claim 1.

Therefore, no possible combination of the teachings of Shimkunas and Shimada could produce the method of claim 11 including the features of defining a photoresist to leave a photoresist region on each conductor line extending from one end part of the line partially covering the surface of the line, and selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line.

Meanwhile, Moshrefzadeh fails even to show any lines of transparent conducting material (the layer 22 is apparently a continuous layer that is later patterned into pixels). Moreover, the metal coating 26 in Moshrefzadeh is **not** electroplated onto layer 22, but instead, Moshrefzadeh specifically teaches that:

> "A metal coating 26 is then **deposited** over the substrate as shown in FIG. 1(c)."

Moshrefzadeh at col. 5, lines 35-36 (emphasis added).

Furthermore, Applicants respectfully traverse the proposed combination of Shimada and Moshrefzadeh as lacking any motivation or suggestion whatsoever in the prior art. Indeed, the Office Action failed to explain at all how or why it is proposed to combine Moshrefzadeh with Shimada.

Therefore, no possible combination of the teachings of Shimada and Moshrefzadeh could produce the method of claim 11 including the features of defining a photoresist to leave a photoresist region on each conductor line extending from one end part of the line partially covering the surface of the line, and selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 11 is patentable over Shimkunas or Moshrefzadeh and Shimada.

Claims 12-13 and 15

Claims 12-13 and 15 depend from claim 11 and are deemed patentable for at least the reasons set forth above with respect to claim 11, and for the following additional reasons.

As explained above with respect to the rejection of claims 2-10 over the combination of Shimkunas or Moshrefzadeh and Shimada, claims 12-13 and 15 recite numerous specific features which are not even mentioned anywhere in the Office Action. Applicants respectfully request a citation to something in Shimkunas and Shimada that supposedly discloses these features, or a withdrawal of their rejection over Shimkunas and Shimada.

Claim 14

Among other things, the display device of claim 14 includes an active plate made according to the method of claim 11. As explained above, no possible combination of the teachings of in Shimkunas or Moshrefzadeh with Shimada could produce the method of claim 11. Therefore, they also could not produce the display device of claim 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit

that the device of claim 14 is patentable over Shimkunas or Moshrefzadeh and Shimada.

DOUBLE PATENTING

The Office Action rejected claims 1-20 under the judicially-created doctrine of obviousness-type double patenting over U.S. Patent 6,498,087, and *provisionally* rejected claims 1-20 under the judicially-created doctrine of obviousness-type double patenting over U.S. Patent application 10/265,877 (which is a divisional of the application which issued as U.S. Patent 6,498,087).

Applicants respectfully traverse those rejections for at least the following reasons.

For example, among other things the methods of claims 1-10 and 16-20 all include providing a covering layer extending from an end part of a line, and applying a plating potential to each line at the end part thereof. Meanwhile, among other things, the methods of claims 11-15 all include defining a photoresist to leave a photoresist region on each conductor line extending from one end part of the line partially covering the surface of the line, and selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line. None of these features are recited or suggested by any of the claims of U.S. Patent 6,498,087 or U.S. Patent application 10/265,877. Indeed, the claims of U.S. Patent 6,498,087 and U.S. Patent application 10/265,877 all pertain to a process directed toward conductive **layers**, while the claims of the present application all pertain to a process directed toward conductive **lines**.

Furthermore, the claims of U.S. Patent 6,498,087 and U.S. Patent application 10/265,877 all include a feature that edge regions of the photoresist layer are provided with a taper, and then etching the photoresist layer such that at least part edge regions are completely removed. None of the claims of the present application require any tapers to edge regions, or removal of at least part of edge regions of the photoresist layer.

Therefore, Applicants respectfully submit that the claims of the present application are directed toward a completely different invention than that claimed in either U.S. Patent 6,498,087 or U.S. Patent application 10/265,877.

Accordingly, Applicants respectfully submit that all of the claims 1-20 are patentable over any of the claims of U.S. Patent 6,498,087 and U.S. Patent application 10/265,877.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 1-20 and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (703) 715-0870 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment (except for the issue fee) to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

VOLENTINE FRANCOS, P.L.L.C.

Date: 26 November 2003

By: _____
Kenneth D. Springer
Registration No. 39,843

VOLENTINE FRANCOS, P.L.L.C.
12200 Sunrise Valley Drive, Suite 150
Reston, Virginia 20191
Telephone No.: (703) 715-0870
Facsimile No.: (703) 715-0877